Remarks

Applicant respectfully requests favorable consideration of this office action response and amendment, as well as consideration of the pending claims as amended herein. The Examiner is encouraged to contact the undersigned by telephone to facilitate any remaining questions or issues.

Status of Pending Claims:

Claims 216-220, 222-229, 231-232, 235, 237-253, 258-260, 342 and 350 are pending in this application.

There are no claims which are (Currently amended).

Claims 216, 218-229, 222-224, 227-229, 231-232, 235, 237, 239-244, 247-250, 252-253, 258-260, 342 and 350 are (Previously presented).

Claims 217, 220, 225-226, 238, 245-246 and 251 are (Original).

There are no claims which are (New).

Claims 1-215, 221, 230, 233-234, 236, 254-257 are (Canceled).

Claims 261-341 and 343-349 are (Withdrawn).

Summary of Examiner's Claim Rejections:

Claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258, 342, are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.). Claim 223 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6588212 (Wallace et al.). Claims 225-227 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 5899072 (Gode). Claims 231, 235 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 5516359 (Kang et al). Claim 237 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 4440545 (Weidig). Claim 241 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 3975913 (Erickson). Claim 242 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 4664857 (Nambu). Claims 259-260, 350 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6212876 (Gregory et al.). Claims 244-247 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6698183 (Thordarson).

The Claims

Claims 1 – 215 (Canceled)

216. (Previously presented) An engine comprising a combustion chamber, wherein a mixture of oxygen, as O_2, and hydrogen, as H_2, is combusted, wherein

at least a portion of said oxygen is obtained by the separation of air, wherein

the separation of air is selected from the group consisting of:

(a) cryogenic separation,

(b) membrane separation,

(c) pressure swing adsorption, and

any combination thereof, wherein

at least a portion of the energy of combustion creates at least one of:

mechanical rotating energy, and

steam in the combustion chamber, wherein

at least one of the mechanical rotating energy and the steam powers at least a portion of said air separation, and wherein

the temperature of combustion is at least partially controlled with the addition of water to said combustion chamber in a way that maintains combustion or combustion exhaust temperature.

217. (Canceled)

218. (Previously presented) The engine of claim 216, wherein said rotating mechanical energy turns a generator to create electrical energy.

219. (Previously Presented) The engine of claim 216, wherein the steam produced by combustion turns a steam turbine, and wherein

said steam turbine turns a generator to create electrical energy.

220. (Original) The engine of claim 216, wherein heat is created.

221. (Canceled)

222. (Previously presented) The engine of claim 218 or 219, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen, and wherein

at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

223. (Previously presented) The engine of claim 216, further comprising nitrogen or argon in said mixture.

224. (Previously presented) The engine of claim 216, wherein said oxygen further comprises air.

225. (Original) The engine of claim 216, wherein at least a portion of the steam produced by combustion is converted to hydrogen by the corrosion of at least one metal.

226. (Original) The engine of claim 225, wherein the conversion of said steam into said hydrogen is increased by an electrical current in said metal(s).

227. (Previously presented) The engine of claim 225 or 226, wherein said hydrogen is at least partially used in said mixture.

228. (Previously presented) The engine of claim 216, wherein a generator turns due to the movement of air or water, and wherein

said generator creates electrical energy, and wherein

said electrical energy is at least partially utilized in the electrolysis of water to hydrogen and oxygen, and wherein

at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

229. (Previously presented) The engine of claim 216, wherein a photovoltaic cell creates electrical energy, wherein

said electrical energy is at least partially used in the electrolysis of water to hydrogen and oxygen, and wherein

at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

230. (Canceled)

231. (Previously presented) The engine of claim 216, wherein at least a portion of the nitrogen separated from air in said cryogenic air separation unit is used to cool any portion of at least one selected from a list consisting of: said cryogenic air separation unit, the storage of oxygen, the storage of hydrogen, electrolysis, coolant for said engine, said engine and any combination thereof.

232. (Previously presented) The engine of claim 231, wherein said nitrogen separated from air in said cryogenic air separation unit is at least partially used to cool air or water.

223 - 234. (Canceled)

235. (Previously presented) The engine of claim 216, wherein said oxygen separated from air is at least one of enriched oxygen, pure oxygen and very pure oxygen.

236. (Canceled)

237. (Previously Presented) The engine of claim 216, wherein at least one selected from a list consisting of a: corrosion inhibitor, chelant, dispersant and any combination therein is added to at least a portion of the water in said engine.

238. (Original) The engine of claim 216, wherein said engine performs at least one of: internal, turbine and heating combustion.

239. (Previously Presented) The engine of claim 216, wherein at least one of oxygen and hydrogen is stored in at least one of a cooled gas state and a liquid state by liquefaction.

240. (Previously Presented) The engine of claim 239, wherein compressor(s) for at least one of cooling and liquefaction is powered by at least one of said engine and a fuel cell.

241. (Previously Presented) The engine of claim 240, wherein said fuel cell is powered by hydrogen and at least one of oxygen and air.

242. (Previously Presented) The engine of claim 216, wherein at least one of said hydrogen and oxygen is stored in a mixture with frozen water crystals to form a gel.

243. (Previously presented) The engine of claim 216, wherein at least one selected from a list consisting of: hydrogen, oxygen and water is preheated prior to combustion with the energy from at least one selected from a list consisting of: ambient temperature, said engine, said engine exhaust, an electrical radiant heat source and any combination therein.

244. (Previously presented) The engine of claim 216, wherein said mechanical rotating energy enters a transmission, wherein

said transmission engage in a manner that is inversely proportional to at least one of the torque and work output of said engine, and wherein

said transmission output mechanical rotating energy turns a generator to create electrical energy.

245. (Original) The engine of claim 244, wherein said transmission engage a flywheel capable of storing rotational kinetic energy, wherein

said flywheel turns said generator.

246. (Original) The engine of claim 244, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen.

247. (Previously presented) The engine of claim 246, wherein at least a portion of at least one of said hydrogen and oxygen is used in said mixture.

248. (Previously Presented) The engine of claim 216 or 219, wherein a pressure control device is in said engine exhaust.

249. (Previously Presented) The engine of claim 216, wherein at least one of said engine combustion heat energy and said engine exhaust energy is used to heat at least one of a gas and a liquid.

250. (Previously Presented) The engine of claim 249, wherein at least one of the gas is air and the liquid is water.

251. (Original) The engine of claim 250, wherein said exhaust discharge directly into said air or water.

252. (Previously presented) The engine of claim 216, wherein at least a portion of said engine is insulated.

253. (Previously presented) The engine of claim 216, wherein hydrogen is separated from at least one selected from a list consisting of: water, air, nitrogen, oxygen and any combination thereof within said air separation unit.

254 - 257. (Canceled)

258. (Previously presented) The engine of claim 216, wherein the temperature of said engine exhaust is at least partially cooled with the addition of water to said engine exhaust.

259. (Previously presented) The engine of claim 258, comprising jet propulsion.

260. (Previously presented) The engine of claim 216 or 258, comprising rocket propulsion.

Claims 261 - 341 (Canceled)

342. (Previously presented) The engine of claim 216, wherein said engine comprises a turbine.

Claims 343 - 349 (Canceled)

350. (Previously presented) The engine of claim 216, comprising jet propulsion wherein air is stoichiometrically increased in the jet intake for hydrogen thermodynamics and/or to operate with excess air for cooling.

Examiner Arguments and Applicant Responses

Examiner Argument

The Examiner suggests that Applicant either amend the claims pursuant to the Examiner's suggestion or file an appeal.

Applicant's Response

Applicant appreciates time of the Examiner to review Applicant's Office Action Response and formulate his argument. Applicant respects and appreciates the Examiner's suggestion; however, respectfully, Applicant asks that the Examiner review the submitted material and argument of Applicant. While Applicant may be Pro Se', Applicant has experience in this matters in the prosecution of many patents, as well as both through a federal trial and through the federal court of appeals; therefore, Applicant respectfully asks for respect of the Examiner to completely reivew material submitted by Applicant and argument submitted by Applicant.

Examiner Argument

The Examiner argues that: 1) Tindel teaches the concept of combusting oxygen, hydrogen and water to drive a steam turbine with a power feedback loop. 2) Penfornis et al teaches the air separation unit and the output of the steam turbine can be used to drive the air separation unit, 3) the flue gas is not part of the rejection, and 4) Applicant keeps on attacking the references individually throughout prosecution of this application.

Applicant's Response

Applicant appreciates time of the Examiner to review Applicant's Response and formulate his argument. Applicant respectfully presents to the Examiner in relation to the Examiner's argument that: 1) Tindel *does not teach the combustion of water*; further, *water is not combustible*; and if needed, Applicant can provide many references to that point; 2) the Examiner is mistaken on the teaching of Penfornis et al.; as, Penfornis et al. requires flue gas *from combustion*; again, in the abstract:

> An air separation unit separates air into an oxygen-rich and oxygen-deficient gas. Fuel gas and the oxygen-rich gas are preheated at heat exchangers through which hot flue gas flows. Combustion of the preheated fuel and oxygen-rich gases result in the hot flue gas. The hot flue gas is cooled at the heat exchangers and flows through a waste heat boiler. Water and/or steam flowing through the waste heat boiler

> absorbs energy from the cooled flue gas thereby producing heated steam. The heated steam flows through a turbine to produce power. The power is transferred to the air separation unit, thus reducing a power requirement of the air separation unit needed to separate the air. Emphasis added.

Therefore, flue gas is part of the rejection; as, 3) *Penfornis, et al. cannot function without flue gas from combustion*; and 4) the instant claim *does not comprise flue gas from combustion*; wherein strong contrast, the instant claim comprises either rotating mechanical energy or steam from combustion (torque and H_2O are not flue gas) from combustion to power air separation. Again, respectfully, Penfornis, et al. teaches use of a "flue gas" *from combustion* to produce heated steam, e.g. the heat exchanger "absorbs energy from the cooled flue gas thereby producing heated steam". Therefore, and without question, the instant claims and Penfornis et al have distinctly separate teachings; or put another way, Penfornis et al does not teach the instant claim to power air separation. Specifically, instant claim 216:

216. An engine comprising a combustion chamber, wherein a-mixture of oxygen, as O_2, and hydrogen, as H_2, is combusted, wherein

at least a portion of said oxygen is obtained by the separation of air, wherein

the separation of air is selected from the group consisting of:

(a) cryogenic separation,

(b) membrane separation,

(c) pressure swing adsorption, and

any combination thereof, wherein

at least a portion of the energy of combustion creates at least one of:

→ mechanical rotating energy, and

→ steam in the combustion chamber, wherein

at least one of the mechanical rotating energy and the steam powers at least a portion of said air separation, and wherein

the temperature of combustion is at least partially controlled with the addition of water to said combustion chamber in a way that maintains combustion or combustion exhaust temperature.

Applicant, then, respectfully presents to the Examiner that between Tindel, et al. and Penfornis, et al., not all of the limitations within instant independent claim 216 are taught.

Applicant respectfully presents, then, to the Examiner, in light of the above evidence and argument, to obtain the instant independent claim, one must perform "hindsight reconstruction"; as, not all of the instant independent claim elements are taught in the citations (ref. MPEP 2141 I, 2141.01(a) III, 2142, 2145 XA. Further, as the second citation, Penfornis et al. teaches the combustion of a hydrocarbon, Penfornis et al. teaches away from the instant claims (ref. MPEP 2131.05, 2141.03 VI, 2143.01 I, 2144.05 III, 2145 XD.

Examiner Argument

The Examiner states that "he fails to see" where declarants Walker and Vaughan provide any supportive evidence; the Examiner states that the declarations are conclusory.

Applicant's Response

Applicant respectfully states to the Examiner that the Examiner previous complained of the Walker and Vaughan declarations "It refer(s) only to the system described in the above referenced application and not to the individual claims of the application"[1]. Prior, the Examiner complained of the declarations "the declarations fail to compare the claimed subject matter with the closest prior art as required in MPEP 716.02(e)"[2]. Applicant respectfully states to the Examiner that "the Examiner is a moving target". As Applicant continuously takes more and more time of these distinguished and retired professionals, Applicant would appreciate some respect for their time from the Examiner. Applicant would appreciate it if the Examiner would take the time to prepare a complete Office Action in regard to the declarations; so that, these distinguished professionals are not continuously contacted to review the instant claims along with the Examiner's cited prior art to state their declarations, again and again.

However and in direct response to argument of the Examiner, paragraph 15 of the Walker declaration states "I have reviewed the pending claims as of this date within U.S. Patent Application 10/790,316 and compared with the prior art cited by the Patent Examiner... I do not find this prior art cited by the Patent Examiner to have made the pendign claims within U.S. Patent Application 10/790,316 as obvious. In fact, I find Penfornis et al. and Wallace et al. as improvements upon existing hydrocarbon processes; whereas the Haase Application is a new and different process. In many instances, I find the art cited by the Patent Examiner to lead one away from the panding claims iwthin U.S. Pat. Application 10/790,316."

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[1] Examiner Office Action dated June 8, 2009, p. 2.
[2] Examiner Office Action dated May 28, 2008, p. 3.

Further, Mr. Walker states in paragraph 11 of his May 1, 2009 declaration "As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion. It is my understanding and belief that this teaching will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber previous. It is my opinion that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity".

Further also, Mr. Walker states in paragraph 14 of his May 1, 2009 declaration "As combustion methods, engines and devices comprise a significant market and as there exist many marketed devices within the combustion, engine and turbo-machinery industries in combination with a world wide knowledge of the environmental consequences of hydrocarbon combustion methods, there should not previously nor today exist any lack of interest or lack of appreciation of an invention's potential or marketability to a method or apparatus as presented and claimed in the invention of Mr. Haase, U.S. Patent Application 10/348,071".

Mr. Chester Vaughan states in paragraph 4 of his December 2, 2009 declaration "Based on my experience, I believe I should be viewed as someone of expert skill in the art of combustion science and engineering. ***Based on my review of Mr. Haase's pending claims, as evidenced in Exhibit A, I believe that the pending claims of this patent comprise a novel approach which would satisfy a long felt need for humanity***".

Further also still, Mr. Chester Vaughan states in paragraph 5 of his December 2, 2009 declaration "My decision that Mr. Haase's pending claims answer a long felt need of humanity is first based upon the fact that prior to and subsequent to Mr. Haase's pending claims, there is no solution within the art for a combustion engine which would operate without the production of oxides of carbon. There is a long felt need for a combustion engine which would operate without the production of oxides of carbon and which provides adequate power and/or torque per displacement. As is known by most of humanity, global climate change is a significant threat to life as is known today; therefore, the long felt need of a combustion engine which would operate without the production of oxides of carbon has been a persistent and well known long felt need for those in the art and has been known by those of ordinary skill in the art."

Further still also, Mr. Chester Vaughan states in paragraph 6 of his December 2, 2009 declaration "My decision that Mr. Haase's pending claims answer a long felt need of humanity is second based upon the fact that no one else prior to or since Mr. Haase's pending claims has satisfied humanity's long felt need for a combustion engine which would operate without the production of oxides of carbon and which would provide adequate power and/or torque."

Further yet still also, Mr. Chester Vaughan states in paragraph 7 of his December 2, 2009 declaration "My decision that Mr. Haase's pending claims answer a long felt need of humanity is third based on my belief that application of Mr. Haase's pending claims, along with knowledge of those of ordinary skill in the art, will answer the long felt need of humanity for a combustion engine which operates without the production of oxides of carbon and which would provide adequate power or torque".

Further still yet also, Mr. Chester Vaughan states in paragraph 8 of his December 2, 2009 declaration "As claimed by Mr. Haase, the use of pure Oxygen instead of air eliminates the dilution effect of nitrogen which allows significant lower peak combustion pressure for the same torque when compared with the current internal combustion engines (or higher torque with comparable peak combustion pressure). While, the industry has recently pursued and is pursuing, options such as pollution control equipment on the current Internal combustion engines, battery and fuel cell electric motor driven systems (including hybrids) to deal with this long felt need for humanity, all of these pursuits have significant disadvantages when compared with the concept described and claimed by Mr. Haase in his patent application (U.S. Patent Application 10/790,316)."

Further still yet also, Mr. Chester Vaughan states in paragraph 9 of his December 2, 2009 declaration "As combustion methods, engines and devices is a significant market and as there exist many marketed devices within the combustion, engine and turbo-machinery industries in combination with a world wide knowledge of the environmental consequences of hydrocarbon combustion methods, there should not previously nor today exist any lack of interest or lack of appreciation of an invention's potential or marketability to a method or apparatus as claimed and presented in U.S. Patent Application 10/348,071."

Applicant could go on with the Examiner. Applicant respectfully refers the Examiner to the declaration of Colin Walker dated May 1, 2009 and to the declaration of Mr. Chester Vaughan dated December 2, 2009. Applicant respectfully presents to the Examiner that these declarations of Mr. Walker and Mr. Vaughan demonstrate proper evidence pursuant to MPEP § 716 and case law. If the Examiner believes otherwise, Applicant respectively asks that the

Examiner be more explicit in his expectations and what that Applicant should seek from these distinguished declarants so as to ascertain if they can agree.

Examiner Argument

The Examiner argues against the statement of GIM Resources, for which Applicant believes demonstrates significant skepticism and disbelief. The Examiner states that "Nothing about the claimed invention of this application was mentioned".

Applicant's Response

Applicant respectfully states that the patent was mentioned in the statement of Element Markets. Specifically, the report of Element Markets states "Unfortunately, ***the patent application*** primarily demonstrates a complete lack of understanding by the inventor of the thermodynamics of existing fossil fuel/air combustion engines as well as a lack of understanding of the thermodynamics of the proposed invention...I suggest that Element Markets not pursue this technology.". (Emphasis added)

Therefore, Applicant respectfully states to the Examiner that "the patent application" and the teachings therein which support the instant claims were specifically mentioned.

Examiner Argument

The affidavit under 37 CFR 1.132 filed May 4, 2009 is insufficient to overcome the rejection of claims based upon the rejection based on 35 USC 103 as set forth in the last Office action because: It refer(s) only to the system described in the above referenced application and not to the individual claims of the application. Thus, there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716.

Applicant's Response

Applicant respectfully states that the Examiner should review the stated declaration; as, in §§ 5, 8, 9, 11, 12, 13 and 15, the delcarant specifically refers to "the claims". Therefore, as declarant has apparently met the stated need of the Examiner, Applicant asks that the Examiner either accept work of the declarant or be more specific with needs of the Examiner.

Examiner Argument

The Declaration of Mr. Colin Francis Walker has been considered but fails to overcome the 103 rejections because it refers mostly to the referenced application, .e.g, paragraph 7 states "there is no known method of apparatus to combust hydrogen with a pure form of oxygen without storage of oxygen"; paragraph 9 states "combust a pure form of hydrogen with a pure form of oxygen", these are not parts of the independent claims, and maybe new matter.

Applicant's Response

Applicant respectfully responds to the Examiner that the instant independent claim is limited to "oxygen, as O_2, and hydrogen, as H_2", which are obviously pure forms. Further, Applicant respectfully states to the Examiner that it is well known in the art that oxygen is a dangerous chemical to store, e.g. Apollo on the launch pad is one example. Therefore, declarant is providing to the Examiner factual evidence as to the inventiveness claimed; further, Applicant refers the Examiner to §§ 11 and 15 of the Walker declaration. Applicant presents to the Examiner that declarant is commensurate in scope with the claims. If the Examiner disagrees, would the Examiner please provide direction as to the wording so sought after by the Examiner so that Applicant can ascertain if declarant can agree with the sought after wording of the Examiner?

Examiner Argument

Furthermore, the declaration does not provide any actual proof, supportive evidence (note MPEP 716.01 (c)), and simply repeat the argument of Applicant which is improper because Applicant arguments cannot take place of evidence, MPEP 716.01 (c). The declaration only mentions the applied references in paragraph 15 with a conclusion "I do not find this prior art cited by the Patent Examiner to have made the pending claims within US Patent application 10/716,316 as obvious", the statement is simply an opinion or a conclusion without any supportive evidence, or simply repeats Applicant's arguments during prosecution which is given little weight.

Applicant's Response

Applicant respectfully presents to the Examiner MPEP § 716.01(c):

I. Objective Evidence Should be Supported by Actual Proof

Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. See, for example, *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) ("It is well settled that unexpected results must be established by factual evidence." "[A]ppellants have not presented any experimental data showing that prior heat-shrinkable articles split. Due to the absence of tests comparing appellant's heat shrinkable articles with those of the closest prior art, we conclude that appellant's assertions of unexpected results constitute mere argument."). See also *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991).

III. Opinion Evidence

Although factual evidence is preferable to opinion testimony, such testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion at issue. While an opinion as to a legal conclusion is not entitled to any weight, the underlying basis for the opinion may be persuasive. *In re Chilowsky*, 306 F.2d 908, 134 USPQ 515 (CCPA 1962) (expert opinion that an application meets the requirements of 35 U.S.C. 112 is not entitled to any weight; however, facts supporting a basis for deciding that the specification complies with 35 U.S.C. 112 are entitled to some weight); *In re Lindell*, 385 F.2d 453, 155 USPQ 521 (CCPA 1967) (Although an affiant's or declarant's opinion on the ultimate legal issue is not evidence in the case, "some weight ought to be given to a persuasively supported statement of one skilled in the art on what was not obvious to him." 385 F.2d at 456, 155 USPQ at 524 (emphasis in original)).

In assessing the probative value of an expert opinion, the examiner must consider the nature of the matter sought to be established, the strength of any opposing evidence, the interest of the expert in the outcome of the case, and the presence or absence of factual support for the expert's opinion. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986). See also *In re Oelrich*, 579 F.2d 86, 198 USPQ 210 (CCPA 1978) (factually based expert opinions on the level of ordinary skill in the art were sufficient to rebut the *prima facie* case of obviousness); *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the "preliminary identification of a human b-NGF-like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); *In re Carroll*, 601 F.2d 1184, 202 USPQ 571 (CCPA 1979) (expert opinion on what the prior art taught, supported by documentary evidence and formulated prior to the making of the claimed invention, received considerable deference); *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

Although an affidavit or declaration which states only conclusions may have some probative value, such an affidavit or declaration may have little weight when considered in light of all the evidence of record in the application. In re Brandstadter, 484 F.2d 1395, 179 USPQ 286 (CCPA 1973).

Therefore, Applicant respectfully presents to the Examiner that according to MPEP § 716.01

(c) (I) "Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need". As previously presented by Applicant, declarants Walker and Vaughan so provide to the Examiner in regard to Long Felt Need. Applicant respectfully presents to the Examiner that Mr. Walker states in § 11 of his May 1, 2009 declaration "As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion. It is my understanding and belief that this teaching will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber previous. It is my opinion that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity." Applicant does not view these as conclusory or opinion statements. If the Examiner does, Applicant asks that the Examiner specifically state that for which he speaks so that Applicant may approach declarant Walker to ascertain if declarant Walker can agree with sought after wording of the Examiner. Further, Applicant presents to the Examiner that Mr. Vaughan states in § 8 of his May 1, 2009 declaration:

8. As claimed by Mr. Haase, the use of pure Oxygen instead of air eliminates the dilution effect of nitrogen which allows significant lower peak combustion pressure for the same torque when compared with the current internal combustion engines (or higher torque with comparable peak combustion pressure). While, the industry has recently pursued and is pursuing, options such as pollution control equipment on the current Internal combustion engines, battery and fuel cell electric motor driven systems (including hybrids) to deal with this long felt need for humanity, all of these pursuits have significant disadvantages when compared with the concept described and claimed by Mr. Haase in his patent application (U. S. Patent Application 10/790,316). The following is a more detailed discussion of the pertinent features and benefits of the patent:

   a. A method of hydrogen combustion which produces no oxides of carbon and no oxides of nitrogen has been a long felt need of humanity; no solution has been previously presented. Previous and on-going attempts of others to solve this long felt need include, but are not limited to, fuel cells, batteries and electric motors and the combustion of hydrogen with air. Fuel cells, utilizing air for its source of oxygen, are less desirable due to many factors including, but not limited to: equipment cost, platinum availability, and the production of oxides of nitrogen. Combustion of hydrogen with air is proving a challenge due to the production of oxides of nitrogen and due to the available torque per cubic inch of displacement. This is all while the environmental consequences increase daily of

humanity's combustion of hydrocarbon fuel. I would also state that said long felt industry need has been known by those of ordinary skill in the art, as well as those of expert skill in the art, of combustion engines and of combustion furnaces for a considerable time previous to the priority date of Mr. Haase's patent application, U.S. Patent Application 10/790,316.

b. A method of hydrogen combustion which produces little to no oxides of carbon nor of nitrogen has been a long felt need which has been known by those or ordinary and of expert skill in the art of combustion and of turbo-machinery for many years, wherein there has not been previously presented a solution.

c. At this time, there is no known method or apparatus to combust hydrogen with a pure form of oxygen without storage of oxygen, a rather combustible and dangerous material to store.

d. I would state that a method or apparatus to combust hydrogen with a pure form of oxygen, as claimed, answers said long felt need.

e. As I have read and understand in the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air as a means to provide a pure form of oxygen to combustion. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.

f. As I have read and understand in the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air to provide a pure form of oxygen to combustion. It is my understanding that this approach will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.

g. As I have read and understand the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air to provide a pure form of oxygen to combustion while using the available cryogenic nitrogen as a means of reducing the temperature of stored hydrogen to a temperature below the joule Thompson curve of hydrogen, thereby improving the storage effectiveness of hydrogen. It is my opinion that this approach and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.

h. As I have read and understand the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, the techniques and methods discussed above, including the benefits can be applied to jet engines, e.g. turbo-machinery. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.

i. While the invention and apparatus claimed and described by Mr. Haase within U.S. Patent Application 10/790.316 represents significant advantages over current approaches and pursuits, the description also represent some development and integration challenges including startup transients which must be overcome to be successful. However, with advances in materials and technology, etc., I believe the patent should be granted and the concept developed.

Applicant does view not these as conclusory or opinion statements. If the Examiner does, Applicant asks that the Examiner specifically state that for which he speaks so that Applicant may approach declarant Vaughan to ascertain if declarant Vaughan can agree with the sought after wording of the Examiner.

Finally, Applicant takes strong exception to the accusation by the Examiner that either declarant is repeating any argument of Applicant. Each of these distinguished declarants have executed their respective declaration upon their thorough review of the instant application, the instant claims and citations of the Examiner as so indicated and of their own volition.

Examiner Argument

Applicant argued Perfornis et al does not disclose the new limitation "creation steam and mechanical rotating energy to drive the air separation unit" in the newly amended claim 216. The Examiner strongly disagrees. Perfornis clearly discloses on the last two lines of his abstract, and on column 6, lines 1-9, that the mechanical power is used to drive a compressor 2 of the air separation unit to reduce power consumption of the air separation system 4. This clearly meets the claimed limitations as noted by Applicant.

Applicant's Response

Applicant refers to Perfornis, et al., both in the Abstract and in col. 6 l. 1-9.

In the Abstract, Perfornis et al. state:

> An air separation unit separates air into an oxygen-rich and oxygen-deficient gas. Fuel gas and the oxygen-rich gas are preheated at heat exchangers through which hot flue gas flows. Combustion of the preheated fuel and oxygen-rich gases result in the hot flue gas. The hot flue gas is cooled at the heat exchangers and flows through a waste heat boiler. Water and/or steam flowing through the waste heat boiler absorbs energy from the cooled flue gas thereby producing heated steam. The heated steam flows through a turbine to produce power. The power is transferred to the air separation unit, thus reducing a power requirement of the air separation unit needed to separate the air. ←

There is no statement in the Abstract of Penfronis et al. for rotating mechanical energy or steam from the combustion chamber as claimed in the instant claim. If the Examiner believes that there is a statement in regard to such rotating mechanical energy or steam in the above, Applicant respectfully asks the Examiner to so point out to Applicant. Further, in col. 6, Penfornis et al. state:

> power. Mechanical power produced by steam turbine **22** is used either to generate shaft power via shaft **25** and/or electrical power via generator **27**. Either one or both of the mechanical and electrical power produced by steam turbine **22** may be used to supply power for other portions of the process or for other processes. Preferably, the mechanical power is used to drive compressor **2**, thereby reducing a power consumption of the air separation system **4** realized in separating air.

Therefore, Penfornis et al. state that mechanical power is produced by a steam turbine, which is not and cannot be the combustion chamber as claimed by Applicant in the instant claim. If the Examiner believes that the steam turbine 22 is the same as the combustion chamber so claimed by Applicant, Applicant respectfully asks that the Examiner so state that how such could be the case.

Examiner Argument

Applicant further argued that independent claim 216 does not disclose flue gas as in Perfornis et al. Please note Perfornis et al is not relied upon to teach the flue gas as argued, but to teach an air separation unit which can be different types of air separation units, and the power output of a steam turbine is used to drive said air separation unit. Please note again Applicant should not attack the references individually but must consider the rejection as a whole. Also, the fact that Perfornis et al teaches more element than the claimed invention (the flue gas) meaning the claims are properly rejected, the rejections are improper only if the references fail to teach any element in the claimed invention.

Applicant's Response

Applicant respectfully states to the Examiner that Applicant is attacking the Examiner's argument in regard to Penfornis et al. in the separation of air and independent claim 216. In that regard; and as previously argued herein by Applicant, Penfornis et al. do not teach the energy from a combustion chamber, regardless of the fuel and oxidizer, to provide steam or rotating mechanical energy to power an air separation unit, as is claimed. In strong contrast, Penfornis et al. teach the generation of a "flue gas" (which can only be generated from a hydrocarbon) which performs heat

transfer to create steam; wherein, it is the heat transfer generated steam that partially powers an air separation unit. Such is not the claimed invention in instant independent claim 1. And, if the Examiner so believes, Applicant would like for the Examiner to accurately so describe to Applicant how that a heat exchanger and a combustion chamber are the same.

Examiner Argument

First, Applicant simply provides his own argument, this is improper, but he must provide argument, Applicant's argument cannot replace evidence in affidavit 312, note MPEP 716.01 (c). Second, the declarations fail to compare the claimed subject matter with the closest prior art as required in MPEP 716.02(e), it's unclear how Applicant can jump to a conclusion that his declaration could overcome the pending rejections without providing any comparison with the prior art, or any opinion about the rejection in the declaration. Third and most importantly, even assuming arguendo that the declaration meet all the requirements that provide evidences, comparison with prior art, opinions about the pending rejections, the Examiner still needs to use his judgment of a person having ordinary skill in the art to make his decision.

Applicant's Response

First, Applicant respectfully presents to the Examiner that Applicant has provided evidence via declarants Walker and Vaughan. Second, Applicant respectfully presents that declarants Walker and Vaughan do compare the instant claims with the prior art cited by the Examiner; specifically in the case of Walker, Applicant refers the Examiner to § 15 and in the case of Vaughan, Applicant refers the Examiner to § 10. Third, in regard to the declarants and their efficacy in this proceeding, Applicant refers to MPEP 716.01(a):

> Affidavits or declarations, when timely presented, containing evidence of criticality or unexpected results, commercial success, long-felt but unsolved needs, failure of others, skepticism of experts, etc., must be considered by the examiner in determining the issue of obviousness of claims for patentability under 35 U.S.C. 103. The Court of Appeals for the Federal Circuit stated in *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538, 218 USPQ 871, 879 (Fed. Cir. 1983) that "evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." Such evidence might give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer*, 451 F.2d 1100, 172 USPQ 126 (CCPA 1971); *In re Fielder,* 471 F.2d 640, 176 USPQ 300 (CCPA 1973). The *Graham v. John Deere* pronouncements on the relevance of commercial success, etc. to a determination of

obviousness were not negated in *Sakraida v. Ag Pro*, 425 U.S. 273, 189 USPQ 449 (1979) or *Anderson's-Black Rock Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A&P Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 87 USPQ 303 (1950). See *Dann v. Johnston*, 425 U.S. 219, 226 n.4, 189 USPQ 257, 261 n. 4 (1976).

Examiners must consider comparative data in the specification which is intended to illustrate the claimed invention in reaching a conclusion with regard to the obviousness of the claims. *In re Margolis*, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986). The lack of objective evidence of nonobviousness does not weigh in favor of obviousness. *Miles Labs. Inc. v. Shandon Inc.*, 997 F.2d 870, 878, 27 USPQ2d 1123, 1129 (Fed. Cir. 1993), *cert. denied*, 127 L. Ed. 232 (1994). However, where a *prima facie* case of obviousness is established, the failure to provide rebuttal evidence is dispositive.

Examiner Argument

Applicant argued there is no motivation to combine the references. The Examiner disagrees. It's very clear in the rejection that using the air separation unit in Tindell can have the advantage "for the purpose of more effectively forming oxygen for the combustion process, and to reserve power input because of the power feedback".

Applicant's Response

Applicant performed a word search in Penfornis et al. and in Tindel. There is no teaching of "power feedback" within Penfornis et al. or Tindel. In fact, the word combination "power feedback" does not even occur in Penfornis et al. or Tindel. Therefore, Applicant respectfully presents to the Examiner that the Examiner's argument is a direct example of Hindsight Reconstruction on the part of the Examiner.

Examiner Argument

Applicant argued Penfornis needs a heat exchanger and his invention does not need that. Please note if the references teach more than the claimed invention, then the rejection is still valid. The rejection is not valid only if the reference does not teach the claimed invention.

Applicant's Response

Applicant refers the Examiner to previous argument herein; wherein, the Examiner's argument is respectfully traversed.

Examiner Argument

Regarding claim 242, Applicant argued Nambu requires a hydrocarbon alcohol. Please note that claim 242 simply recites either hydrogen or oxygen being mixed with frozen water to form gel. Nambu clearly teaches the hydrogel in frozen water under freezing temperature. It does not matter if Nambu needs to use hydrocarbon alcohol because as set forth above, if the reference teaches more than the claimed invention, the rejection is still valid.

Applicant's Response

Applicant respectfully disagrees with the Examiner; as, an alcohol, any alcohol, and hydrogen are different compounds and are then different claim elements. Applicant refers the Examiner to any General Chemistry Text and to 35 U.S.C. 102, 35 U.S.C. 103(a), and MPEP 2141.01 V.

Examiner Argument

Once again, the Examiner would like to repeat all arguments and rejections from the previous Office Action.

Applicant's Response

Applicant so repeats all argument from his last amendment and office action response dated December 7, 2009.

Identification of the Source of the Problem

Finally, Applicant respectfully presents to the Examiner that Applicant, within the instant claims, has identified a solution to a significant challenge of humanity by identifying the "source of the problem" (ref. MPEP 2141.02 III, IV) for which others have expended significant effort. This is evidenced within the instant specification §§ 002-005, 010-021, 041-054, 056-063, and 102-104, as well as the abstract. This is also evidenced within the declaration of Mr. Christopher Vaughan in § 8, as well as within the declaration of Mr. Walker in §§ 15-18.

Claim Allowance

Applicant respectfully requests allowance of claims 216-220, 222-229, 231-232, 235, 237-253, 258-260, 342 and 350, as presented herein.

CONCLUSION

In view of the foregoing, Applicant believes that the claims, as presented, are in order for allowance; Applicant respectfully requests favorable reconsideration of this response and amendment, as well as allowance of the instant claims at the earliest opportunity.

Applicant has respectfully presented to the Examiner that the citations either: **do not teach all of the instant claim limitations or teach away from the intended purpose of the instant claims**; and that, **hindsight reconstruction is required to obtain all of the instant claim limitations**.

Applicant has also respectfully presented to the Examiner that the cited combinations do not present or teach **the source of the problem, e.g. production of oxides of carbon and of nitrogen,** as has Applicant.

In support of Applicant's Argument, Applicant has further respectfully presented secondary considerations in the form of two declarations, one from a person of expert skill in the art and one from a person of ordinary skill in the art, both of which demonstrate that the instant invention and the instant invention claims **answer a long felt and unresolved need**, which has been recognized by those of ordinary skill in the art for some time and which was not answered prior to the filing of the instant invention.

Further, Applicant has further still presented **skepticism and/or disbelief to the instant invention**, as claimed, from two of expert skill in the art, one at the DOD and one consultant.

Applicant appreciates the time and effort afforded by the Examiner in the prosecution of the instant claims for the instant invention.

As Applicant has respectfully traversed all of the Examiner's rejections, Applicant herein requests the award certificate for the instant claims as amended and presented herein.

Respectfully submitted,

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